

## A Multidisciplinary Approach to Dealing with Anterior Diastema and Peg Laterals

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### Abstract

Smile rehabilitation of dental microdontia is a real therapeutic dare. Alterations in size have esthetic, functional, and psycho-social repercussions for patients.

Often associated with diastema and other dental anomalies, patients usually visit seeking an esthetic smile rehabilitation.

Multiple options are now available when it comes to treating encountered problems related to smile refinement. Orthodontic, periodontic, restorative, and prosthodontic, or a combination of all these procedures may be indicated to fulfill the patient's esthetic and functional demands.

This article presents a combination of an orthodontic and prosthodontic procedure as well as the conditioning of the gingival tissue to treat anterior diastema associated with the presence of peg laterals.

### Introduction

We currently live in a society increasingly obsessed with esthetic appearance, prevailing in many times this aspect to the professionals. The face is the first part of the body that we see when we interact. Therefore, facial expressions are the most important in esthetics, since any defect can lead to rejection of the observer or even, in many times, insecurity or complexes in the person who owns it [1].

This explains the rapid advancement we've been witnessing in the area of cosmetic dentistry over the past years.

A dentition with spaces may be considered normal and acceptable to some patients, whereas to others, it may look unsightly which leads to esthetic treatment-seeking [2].

Microdontia is considered to be one of the most common reasons for multiple spacing in the anterior region. Chattopadhyay and Srinivas had also shown that a significant number of microdontia cases were associated with peg laterals [3].

The presence of both improper anterior spacing and peg laterals may look displeasing to some patients who, unsatisfied and unconfident, come looking for an esthetic smile rehabilitation.

Ideally, the teeth should be in the right proportion and form, in appropriate shade, correctly aligned, and in harmony with the rest of the face [3].

Multiple options are now available when it comes to treating encountered problems related to smile refinement and improvement that keep rising at a high rate.

Offering our patients the confidence of the perfect smile they're looking for comes along with many terms and conditions to consider. The used materials, the esthetic parameters, the appropriate techniques, and the concept of preserving the remaining tooth structures favor the establishment of a healthy, esthetic, and functional smile.

Porcelain veneers have been shown to be a successful and valid option to deal with esthetic problems especially in the anterior zone due to their unique ability to mimic the natural aspect of the teeth. The techniques and materials to fabricate porcelain veneers offer the optical properties of the enamel and dentine such as fluorescence, opalescence, and translucency, as well as intrinsic properties such as biocompatibility, mechanical resistance, and color stability [2].

The aim of this paper is to report the multidisciplinary treatment of a patient with esthetic concerns due to unpleasing anterior spacing associated with a peg lateral using ceramic veneers after receiving both orthodontic and periodontic treatment.

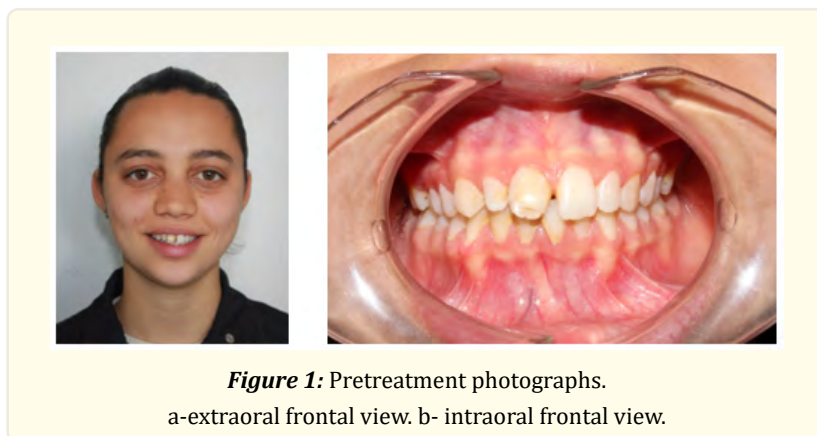
### Case Description

An 18-year-old girl reported to the fixed prosthodontics department at the dental clinic of Monastir (Tunisia) with the chief complaint of a shape anomaly of teeth 11 and 21, and spacing between maxillary central incisors. There was no history of trauma or any hereditary conditions.

Observing the patient from a frontal view, she presented a symmetrical face with parallelism of the lines of reference. The profile view revealed an orthofrontal profile, an open nasolabial angle, and a moderate upper lip protrusion.

Smile examination showed an unsightly dental smile.

On intraoral clinical examination, 12 was peg-shaped, 22 was size reduced, 11 presented localized hypoplasia in the incisal third and a 1 mm diastema was present between central incisors.



A slight anterior spacing was also noted while examining the mandibular teeth.

In occlusion, the patient presented a deep bite with a midline shift.

The radiographic examination confirmed the microdontia diagnosis.



**Figure 2:** Pretreatment panoramic radiograph.

A multidisciplinary management plan was carried out, starting with an orthodontic treatment in order to close the inharmonious spacing and correct the discrepancy between the jaw and teeth size.

The final orthodontic result allowed for favorable alignment of the dentition, and a favorable anterior dental relationship in preparation for the perio-prosthetic esthetic enhancement.



**Figure 3:** Intraoral view in the end of orthodontic treatment.



**Figure 4:** Intraoral view just after gingivectomy.

It is common that chronic inflammatory gingival overgrowth occurs during orthodontic treatment. Non-surgical treatments such as good oral hygiene instructions, scaling, and prophylaxis aren't always effective that's why the periodontist may be obliged to proceed with a surgical intervention to treat the gingival overgrowth and improve the proportionality between the teeth.

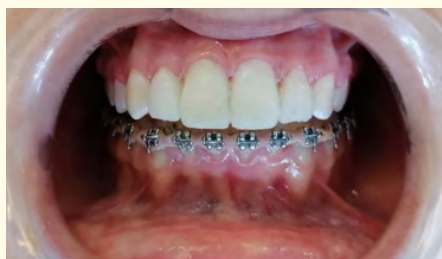


**Figure 5:** 2 weeks after gingivectomy.

Being the most conservative possible, and after receiving both orthodontic and periodontic treatment, aligning the esthetics of white and pink was our ultimate goal. Four lithium disilicate veneers on the peg laterals and on the two centrals were indicated.

After a thorough examination, impressions for diagnostic models were made using irreversible hydrocolloid. Obtained models served to study the shape and size proportions of the teeth with the help of diagnostic wax-up.

The wax-up was then presented to the patient through a mock-up using a provisional resin defining the shape, size and color of the future teeth.



**Figure 6:** Intraoral view of the mockup.

Once the future treatment plan was approved by the patient, vertical and horizontal grooves were performed on the mock-up using a depth cutting diamond bur to guarantee a non-invasive preparation that is limited to the enamel thickness.



**Figure 7:** Grooves to guide enamel preparation.

A tapered diamond bur 1 mm in diameter was then used to complete the vestibular reduction by removing the marked grooves. 0.25 mm chamfer was maintained in the cervical region. The finish lines were kept at the level of gingival margin. The proximal preparation was extended beyond the contact area to avoid visibility of the junction between the tooth and the restoration. The surface was then smoothed, sharp angles and edges were removed.



**Figure 8:** Intraoral view of the preparation.

At the same appointment, gingival displacement was done using a retraction cord and the final impression was made using silicone. Putty consistency silicone was loaded on the tray. At the same time, light body material was syringed around the prepared teeth to record the fine details of the preparations and surroundings. Finally, the previously loaded tray was inserted in the mouth to make the impression.



**Figure 9:** Placement of the retraction cords.



**Figure 10:** Master cast.

Temporary veneers were then fabricated using Protemp for provisional material to protect the prepared teeth.



**Figure 11:** Provisional veneers.

The ceramic shade was determined using Vitapan Classical shade guide and the impression was sent to the laboratory technician.

Ceramic laminate veneer restorations were fabricated with a lithium disilicate-reinforced glass ceramic material using the heat press technique (IPS E-max Ivoclar, Vivadent)

After one week, the patient returned for placement of the final restorations. The preparations were cleaned and the veneers were tried in first individually to check the marginal adaptation, the proximal contact, shape and size. Then they were tried in collectively using a try in transparent paste to approve of the esthetic enhancement.

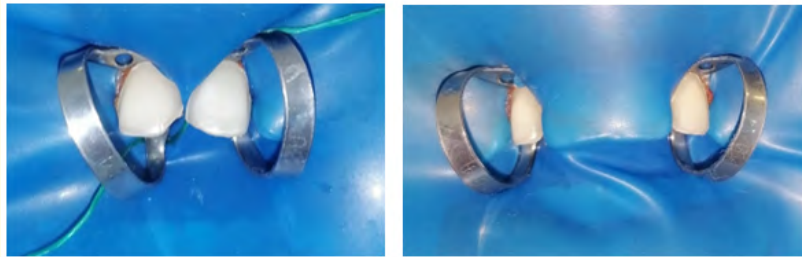
Once the satisfaction of the patient was obtained at the time of the try in, the cementation was proceeded.



**Figure 12:** Try in of the veneers.

A perfect isolation of the prepared teeth using rubber dam was set. The veneers were arranged on a silicone sheet designating the position of the tooth in the arch to avoid anterior misplacement and unintentional breakage. The internal surfaces of the veneers were cleaned and etched with hydrofluoric acid (ceramic Etchant 4,5%) for one min, washed under running water for another minute, and dried with an air syringe.

The enamel surfaces of the teeth were then etched with phosphoric acid (37.5%) and an adhesive was thinly applied, air dried and then light cured for 10 seconds.



**Figure 13 + 14:** Isolation using b4 clamps.

A thin layer of resin cement was loaded in the internal surfaces of the porcelain veneers. The restorations were seated on the teeth while applying a moderate pressure allowing for the luting cement to adapt to the tooth surface.

While holding the veneers in place, light curing for 5 seconds was done and excess resin cement was carefully removed. Then, the veneers were light cured for 40 seconds each on both labial and palatal surfaces.



**Figure 15:** Post cementation frontal view.

The interface between the enamel surface and the ceramic veneers was carefully finished, and polished. The patient was given instructions for regular home care and maintenance of the ceramic veneers.

The follow-up evaluations at 1 month, 6 months, and 1 year after cementation showed a pleasing result. The gingival examination revealed healthy gums and the veneers integration was beautifully done. The patient was very satisfied and confident with her new smile.



**Figure 16:** Intraoral view after 2 weeks. **Figure 17:** Extraoral post treatment result.

## Discussion

The key to a successful outcome is an appropriate diagnosis and a thorough treatment plan. Communication is a required tool to explain the treatment modalities to the patients and coordinate the overall treatment with others involved.

Considering the therapeutic gradient throughout our planning is a must. A carefully developed case study allows the practitioner to choose the most effective orthodontic or/and restorative approach to deal with the presented situation.

In our present case, the patient had improper anterior spacing associated with peg laterals, resulting from underdeveloped permanent teeth [3].

The patient's chief request is acquiring an esthetic outcome. First in line of conservative modalities is orthodontic treatment, which often plays an important role in multidisciplinary approaches to correct the tooth size-jaw size discrepancies, equally re-distribute the spaces, and improve the smile line [4]. Opting for an orthodontic treatment first allowed for a less invasive approach, ruling out the alternative of crowning many sound teeth.

However, usually, patients refuse to opt for it because of the lengthy process and the need for immediate esthetic results [5].

Fortunately, our patient here accepted to receive a fixed orthodontic appliance. The final result showed an equal distribution of diastema, providing sufficient space for veneers and ensuring the right alignment with adjacent teeth.

Obtaining an ideal result calls for equal consideration of the esthetic parameters of both gum and teeth.

Therefore, crown lengthening is frequently utilized as an integral part of the esthetic refinement treatment plan. The periodontist has to meticulously study all the gingival parameters in close relationship with the future veneers in order to guarantee the finest possible esthetic result.

Ceramic veneers offer excellent longevity due to their high mechanical properties, they require minimal tooth preparations and they successfully mimic the natural teeth thanks to their great optic characteristics.

Porcelain laminate veneers offer a predictable and successful outcome with an estimated survival rate of 93.5% over 10 years [6].

It's very important to preserve the enamel while preparing the tooth surface. Due to its highly mineralized structure and low moisture content compared with dentin, porcelain veneers bonded to enamel demonstrated high survival rates, which decreased when bonded to dentin [7].



In a retrospective survey of up to 12 years, Gurel et al. reported that the survival rate of veneers with preparations within the enamel was up to 99% and decreased to 94% for veneers with enamel only at the margins [8].

In the present case, IPS e.max Press was chosen. This material consists of lithium disilicate with a high crystalline content in a glass matrix that was introduced in 2005 replacing the IPS empress II [9]. It was selected because of its optical properties, such as multiple translucencies and opacities that allow the laboratory technician to easily mimic the characteristics of the natural teeth. Furthermore, this ceramic presents slower crack propagation, a high flexural strength of up to 360-400 MPa, and greater fracture resistance [10].

Thus, it actually offers a combination between esthetics and strength. Added to that, this technique utilizes the experience that the lab technician already has in the lost wax method with metal alloys.

### Conclusion

It has become increasingly apparent that conservation of tooth structure is a major factor in determining the long term prognosis of any restorative procedure. When they are cautiously used, porcelain veneers offer a predictable and successful treatment modality that preserves a maximum of sound tooth structure along with excellent esthetics due to lifelike appearance of porcelain and scattering effect of the luting cement.

### References

1. De Rábago-Vega José and Tello-Rodríguez AI. "Porcelain veneers as an aesthetic solution in anterior teeth: report of twelve cases". *RCOE* 10.3 (2005): 273-282.
2. Haifa Barakah. "Esthetic ceramic veneers for spaced anterior teeth utilizing the RED proportion; a case report with three years follow-up". *Journal of Dental Health, Oral Disorders & Therapy* (2021).
3. Tina PuthenPurayil and Shashi Rashmi Acharya. "Management of type II dens invaginatus and peg laterals with spacing of maxillary anteriors". *Journal of Dental Research and Review* 2.3 (2015).
4. IyarintIttipuriphat. "Anterior Space Management: Interdisciplinary Concepts". *Journal of Esthetic and Restorative Dentistry, Wiley Periodicals, Inc* 25.1 (2012): 16-30.
5. AlHanouf A AlHabdan. "Three-Year Follow-Up of Diastema Closure Using Ceramic Veneers: A Case Report". *Dentistry* 7.7 (2017).
6. Pajaree LandChalermopol L. "Esthetic treatment of anterior spacings in a patient with localized microdontia using no-prep veneers combined with periodontal surgery: A clinical report". *M Dent J* August 39.2(2019): 53-64.
7. Ozturk E and Bolay S. "Survival of porcelain laminate veneers with different degrees of dentin exposure: 2-year clinical results". *J Adhes Dent* 16.5(2014): 481-9.
8. Gurel G., et al. "Influence of enamel preservation on failure rates of porcelain laminate veneers". *Int J Periodontics Restorative Dent* 33(2013): 31-9.
9. Christensen GJ. "The all-ceramic restoration dilemma: where are we?". *J Am Dent Assoc* 142(2011): 668-71.
10. Yang Y., et al. "Clinical outcomes of different types of tooth-supported bilayer lithium disilicate all-ceramic restorations after functioning up to 5 years: A retrospective study". *J Dent* 51(2016): 56-61.
11. Bhojar AG. "Esthetic Closure of Diastema by Porcelain Laminate Veneers: A Case Report". *People's Journal of Scientific Research* 47 (2011).
12. Ana Teresa MP. "Minimum intervention management of diastema closure using cordless displacement system and laminate veneers: A 2-year follow-up". *European Journal of Dentistry* 12.3 (2018): 446-449.
13. Muhamad Abu-Hussein. "An Interdisciplinary Approach for Improved Esthetic Results in the Anterior Maxilla Diastema". *IOSR Journal of Dental and Medical Sciences* 14.12 (2015).
14. Dipti Barve. "Interdisciplinary Management of Spacing with Maxillary Anterior Teeth with Orthodontics and Veneers". *IOSR Journal of Dental and Medical Sciences* 18.8 (2019).

15. NúbiaPavesiPini. "Advances in dental veneers: materials,applications, and techniques". *Clinical, Cosmetic and Investigational Dentistry* 4 (2012): 9-16.
16. TassianaCançado Melo Sá., et al. "Esthetic rehabilitation of anterior teeth with different thicknesses of porcelain laminate veneers:An 8-year follow-up clinical evaluation". *European Journal of Dentistry*12.4 (2018): 590-593.

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